TABLE 1

Date	Hour angle	$\frac{10}{t}$	Comments
1934 April 25	**a. m.**		
	2:16	43.3	Wind W. 5-6.
	2:14	48.7	
	2:07	52.6	Visibility 8.
	1:58	61.7	
	1:46	52.6	Clouds 0.
	1:44	61.7	
	1:42	61.7	Blue sky 4.
	1:24	60.6	
	0:39	63.7	
	0:37	69.9	
	p. m.		
	0:19	70.4	Clouds—Ci. fil.
	0:21	59.8	
	0:22	61.7	Ci. unc., Cu., .3.
	0:23	71.4	<15° from sun.
	0:25	71.9	Wind NW.X W. 5-7.
	0:49	71.9	
	1:00	49.5	Cu. near sun.
	1:01	70.4	
	1:10	81.9	Fr.cu. 2° from sun.
	1:12	76.9	
	1:18	66.6	Fr.cu. 10° from sun.
	1:20	70.4	
	3:43	29.5	
April 26	**a. m.**		
	2:11	37.7	
	2:08	39.8	Cist. in N.
	1:56	41.7	Wind SW. 3-4.
	1:52	41.3	Blue sky 4.
	1:48	43.5	
	1:42	45.2	
	1:03	48.1	
	0:35	50.0	
	p. m.		
	0:33	52.6	
	2:18	36.0	
April 29	**a. m.**		
	3:15	25.4	Wind NW. 2.
	2:49	33.0	Visibility 9.
	2:47	33.3	Blue sky 4.
	1:15	40.5	
	1:11	42.2	
	p. m.		
	0:33	43.4	Conditions—excellent.
	0:38	45.3	
	0:41	46.5	
	2:33	36.4	
	2:43	37.4	
	3:37	21.4	
	3:42	20.8	
	4:26	12.2	
Apr. 30	**a. m.**		
	2:42	25.0	
	2:40	25.4	

TABLE 1—Continued

Date	Hour angle	$\frac{10}{t}$	Comments
1934 Apr. 30	**a.m.**		
	2:39	25.3	
	1:49	31.2	
	1:48	32.4	
	0:51	31.8	
	0:49	36.4	
	p. m.		
	1:26	37.0	
	1:27	36.2	
	1:28	36.5	
	2:32	28.5	Light Ci. fil. near sun.
May 1	**p. m.**		
	2:05	32.0	
	2:08	31.6	
	2:12	37.3	Thin Ci. film over sun.
May 5	**a. m.**		
	2:02	63.3	
	2:01	62.5	
	0:59	81.3	Rel. Hum. 95 percent.
	0:56	83.3	Clouds 0.
	0:06	76.9	
	0:04	78.1	
	p. m.		
	0:41	54.6	
	0:43	38.5	Clouds Cu.
May 8	**a. m.**		
	3:09	29.6	
	1:50	23.9	
	1:48	23.9	
	0:43	22.2	Cist film over 0.7 sky, density 0.
	p. m.		
	1:06	33.4	
	1:07	35.7	
	1:22	41.7	
May 9	**a. m.**		
	3:05	30.8	Conditions—good.
	3:02	36.9	
	3:00	37.0	
	2:57	38.5	
	2:55	38.5	
	1:55	45.9	
	1:54	46.5	
	1:52	46.3	
	1:32	52.6	
	1:31	49.3	
	0:31	49.7	
	p. m.		
	0:25	49.7	Cu. coming up and increasing.
	0:54	55.5	
	0:56	52.3	Cu. 3° from sun.
	1:00	53.2	

FORECASTING FROM BAROMETRIC CHARACTERISTICS

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[Meteorological Institute of Brazil, Rio de Janeiro, March 1935]

By the term "barometric characteristic" is meant the form of the barograph curve during the 3-hour interval previous to observations. For telegraphic-code purposes nine types of characteristics are recognized, as follows:

1. Continuous rise.
2. Steady, and now rising.
3. Falling, and now rising.
4. Rising, and now steady.
5. Steady.
6. Falling, and now steady.
7. Steady, and now falling.
8. Rising, and now falling.
9. Continuous fall.

The observations are made at all Brazilian meteorological stations at 9 o'clock Rio de Janeiro legal time, which corresponds to 12 o'clock Greenwich time. The characteristic therefore refers to the period from 6:00 to 9:00. The stations included are the following:

Stations	Belém	F. de Noronha	São Salvador	Cuiabá	Victoria	Tres Lagoas	Rio de Janeiro	Paranaguá	St. Maria
Latitude south	1°28′	3°50′	12°58′	15°36′	20°10′	20°47′	22°54′	25°31′	29°41′
Lontitude west Greenwich	48°27′	32°25′	38°32′	56°06′	40°18′	51°42′	43°10′	48°31′	53°49′
Altitude (meters)	14	106	64	165	32	315	18	9	144

The normal diurnal variation at the various stations is not known; but since in general the pressure is everywhere a maximum about 10 and 22 o'clock, and a minimum at 4 and 16 o'clock, local time, it is easily seen that during the period from 6 to 9 o'clock the normal characteristic should be 1 (continuous rise) at the above stations. The secondary circulations, however, may completely obscure the normal tendency: a rise of the barometer above normal takes place with the appearance of an

anticyclone or the departure of a depression; the appearance of a depression or the departure of an anticyclone may produce a steady or even a falling barometer. Thunderstorms may also, through the classic "crochet d'orage", profoundly affect the characteristic.

In the northern part of the country, variations in the characteristics are due to oscillations of the high-pressure center over the Atlantic, or of the continental depression. These movements are also the cause of weather changes, and hence it is reasonable to look for a connection between the weather and the barometric characteristics. Furthermore, because of differences in topography, latitude, continentality, etc., given types of characteristics will produce different weather conditions at different stations.

The present investigation is based on an examination of 243 weather maps in the years 1930-33, months of January (summer) and July (winter). The probability (in percent) that the weather will remain fair, uncertain, or rainy, for 24 hours after the observations, have been determined for each type of characteristic; characteristics of rare occurrence were not taken into consideration. The results are shown in the accompanying figures, which are self-explanatory.

At F. de Noronha, São Salvador, and St. Maria there is greater probability of rain in the winter than in the summer; on the contrary, rain is more frequent in the summer at Belém, Cuyabá, Tres Lagoas, Rio de Janeiro, Victoria, and Paranaguá.

In summers, at the coast stations (Belém, São Salvador, Victoria, Rio de Janeiro, and Paranaguá) rain is more probable with characteristic 1 (the only exception is found in Paranaguá), and less probable with characteristics 4 and 5. The more frequent formation of local thundershowers under inactive isobaric conditions with a normal diurnal variation, perhaps explains the greater frequency of rain under characteristic 1.

A steady barometric curve at São Salvador, Victoria, and Rio de Janeiro, accompanying a diminution of the Atlantic HIGH, indicates a probability of good weather.

In Paranaguá, which is more subject to the activity of the secondary circulations because of its latitude, steady characteristics, due to the passage of depressions, indicate bad weather. In the winter, characteristics 1 and 2 still give the highest probabilities of rain, due to the more frequent occurrence of anticyclones (with the exception, naturally, of Belém).

At the continental stations (Tres Lagoas, Cuyabá, St. Maria) rain is more probable with characteristics 2, 3, 4, and 5. In the summer these characteristics signify an alteration of the normal diurnal variation, and indicate a greater activity of the continental depression at the first two stations—that is, a great increase of heat, leading to thundershowers and heavy rains in the summer; in St. Maria they accompany the appearance of depressions and are likewise inclined to produce rain in any period of the year. During the winter, in Cuyabá and Tres Lagoas, rain is very infrequent because of the absence of local thundershowers.

Finally, the probabilities of various weather conditions are more or less equal, no matter what the type of characteristic, at Farrando de Noronha.

Although we have not given a complete explanation of the connection between barometric characteristics and weather conditions, we regard the probabilities found to be helpful in short-period weather forecasting.